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THE
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☞See advertisement on last page.

Poetry.

Mr. Adams's Last Efforts.

On the day preceding his fatal attack, Mr. Adams composed the following stanzas, designed to accompany his autograph signature which had been requested by a female friend.

JOHN QUINCY ADAMS.
Quincy, Massachusetts.

In days of yore, the poets pen
From wing of bird was plundered,
Perhaps of goose, but now and then,
From Jove's own Eagle sundered,
But now, metallic pens disclose—
Alone the poet's numbers;
In iron, inspiration glows,
Or with the minstrel slumbers.

Fair damsel, could my pen impart
In prose or lofty rhyme,
The pure emotions of my heart,
To speed the flight of time;
What metal from the womb of earth
Could worth intrinsic bear
To stamp with corresponding worth
The blessings thou shouldst share?

And on the very day on which he fell he penned the following.

TO THE MUSE OF HISTORY.

Perched on her rock-wheeled and winged car over the front door of the Hall of the House of Representatives of the United States.

Muse; quit thy car! come down upon the floor,
And with thee bring that volume in thy hand,
Rap thy marble knuckles at the door,
And take at a reporter's desk thy stand,
Send round thy album, and collect a store
Of autographs from rulers of the land;
Invite each Solon to inscribe his name,
A self-recorded candidate for fame.

JOHN QUINCY ADAMS.

SING ON! SING ON!

Sing on! sing on! sweet maiden sing!
The gladdened moments swiftly fly—
They will not stay, but thou with song,
May'st gild them as they're passing by.

Sing on! sing on! all hearts are thine—
The cares of life thou dost beguile—
And willing captives we'll remain
Of thy sweet seraph voice the while.

Sing on! sing on! oh! cease not yet!
With every note a charm is borne;
Now, softer than the evening wind,
Now rivalling the bird of Morn!

Sing on! sing on! thou Queen of song!
Thy strains enrapture ev'ry ear:
May Providence thy life prolong,
And love and friends its journey cheer.

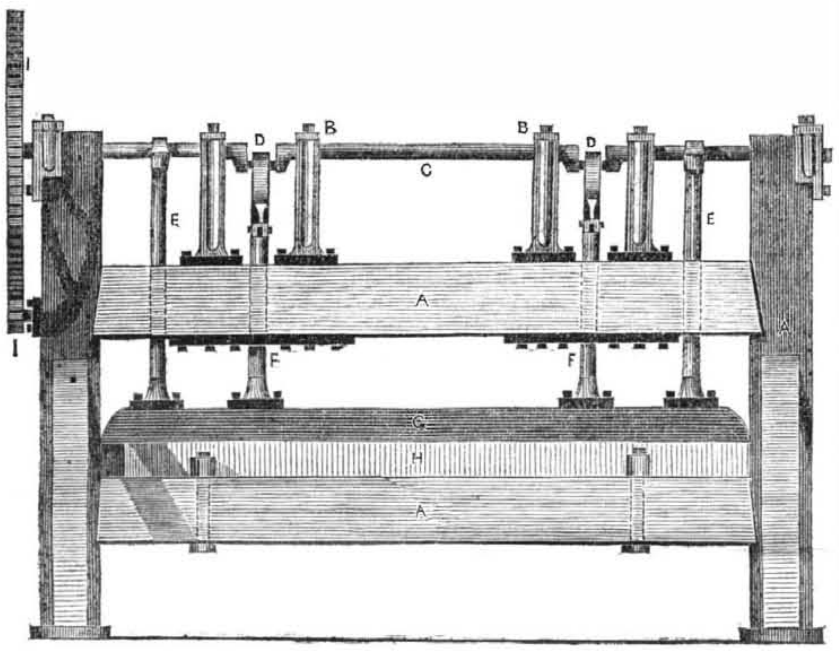
Sing on! sing on! heed not the time,
Our hearts are light the night is young—
Sing on! sing on! strains so sublime,
In mortal ears were never sung!

Sing on! sing on! oh! sing away!
Thy notes are sweet as those of spring—
Sing on! sing on! we'll ever stay,
If thou, sweet maid, wilt ever sing.

A writer on school discipline says:—"Without a liberal use of the rod it is impossible to make boys *smart*."

MACHINE FOR STAMPING METAL PLATES.

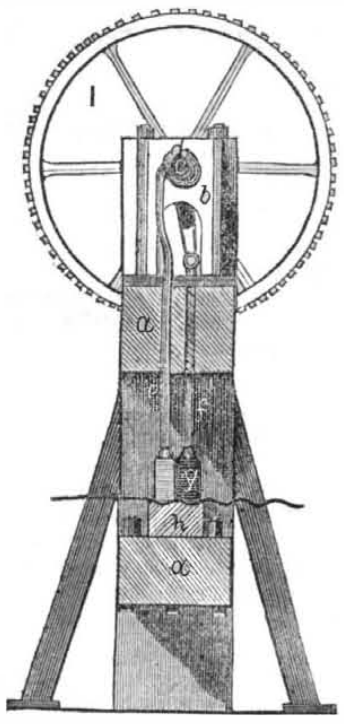
Figure 1.



This machine in combination with a new process of coating iron with zinc and tin, is the invention of E. Morehead and G. Rogers, of Hearndale, England.

Figure 1, is a front elevation, and Figure 2 is a transverse section of it. We combine the description of both for greater clearness as the like parts are indicated by the same letters on both figures, with the exception of Italics for Roman characters on the section. A A, is the frame. B B, four vertical standards, forming bearings for the shaft C C. D D, cranks with connecting motion links working on the crank pin. F F, connecting rods passing through the longitudinal beam A, and attached to the upper die plate G. E E, two connecting rods also passing through the beam A, and attached to a similar formed die for the purpose of holding the metal plates down during the progress of corrugation. H, is the under die bolted to the bed or cross frame A, this die has an undulating surface which will be understood by reference to the transverse section,

FIGURE 2.



which represents a sheet of metal being passed through and partly corrugated. The action of the machine will be understood as follows:—Motion is first given to a pinion, which is transmitted to the wheel I, and from thence to the crank shaft D. The cranks on being put in motion, cause the connecting links F, to be alternately raised and lowered, producing the same effect upon the upper die G, in connection with it; producing thereby, by the alternate rise and fall of the stamping die, the corrugation aforesaid,—all subordinate parts being readily comprehended by reference to the engraving, without further explanation.

The other part of the invention in connexion with this machine, is the coating of iron with an alloy of tin and zinc, so as to combine the advantages of tin, as a covering; at the same time, to obtain a harder coating than could possibly result from the use of either of these metals alone. The best proportions of these two metals is one half tin, and one half zinc With less tin the adherence of the coating is not so effective. A small quantity of lead, however, may be used for cheapness. They also use an alloy of zinc with antimony, and mixing a portion of lead therwith, consisting of the proportion of fifty parts of zinc, thirty-four parts of lead, and sixteen parts of antimony well stirred together. In order to amalgamate the metals thoroughly it is necessary to melt the lead to a red heat before inserting the antimony: the effect of which, if properly attended to, will be found exceedingly useful for casting into ingots; the remelting of which, subsequently to the former process, requiring to be added a portion of zinc. As a flux they employ chloride of manganese, if the products or depositions of zinc be used in making the alloy, or, on the other hand, if the zinc alone, salammoniac.

The rollers in the above cuts revolve in the flux kept heated to a rather lower degree than the melting point of the coating metal, by which means the coating is properly acted upon by the rollers and therefore the sheets to be coated and stamped are passed through a box in which is the molten metal, and then drawn through the rollers of the machine. The whole process simply is, to cleanse iron sheets, or hoops, the same as for tinning, and passing them through a bath of the above alloy, or alloys, and submitting them to the rollers in the bath to stamp the sheets and finish them of any form at one operation.

The Lumbering business is rapidly increasing in Wisconsin. By the opening of the Illinois canal an immense market will be found in the interior of that state.

RAIL ROAD NEWS.

New York and Philadelphia Rail Road Fare.

A resolution, highly interesting to the whole travelling community, has been adopted by the New Jersey House of Representatives, instructing the State Directors of the Camden and Amboy Railroad to insist upon the establishment of a daily line between New York and Philadelphia, running at convenient hours, by way of Camden, New Brunswick, &c., at $3 fare. The law now prescribes that the company shall not charge over $3 but it is evaded by the road crossing the Deleware at Trenton, and continuing the remainder of the way on the Pennsylvania side, upon a road that is chartered by that State.

St. Joseph and Hannibal Railroad.

Petitions have been presented to Congress from citizens of Missouri, praying a grant of public lands lying in that state to the proposed rail road from Hannibal to St. Joseph. The United States have some interest in the road, as an avenue to the frontier posts; and no doubt can be entertained that the road would tend greatly to enhance the value of the public lands, and to increase the population of the State along the route, thus adding to the consumption of goods, wares, and merchandize, paying custom and import duties to the National Treasury. A rail road through the centre of Missouri, to the Western line, with branches to the northern and southern portions would bring to market an amount of hemp, tobacco, lard, bacon, beef, &c., that would astonish us down easters—to say nothing of the iron, lead and copper interests.

A bill has been introduced in the Alabama Legislature, to charter a Railroad from Pensacola Fa., to Eufaula, Ala., designed to intersect with the South Western Georgia Rail-Road.

We learn that most of the laborers on the line of Railroad from Greenfield, Mass., to the State line, and also those on the Vermont and Massachusetts line, have struck for higher wages and have not worked for several days.

The bill to incorporate the Mobile and Ohio Railroad Company has become a law of Mississippi

Manufacturing Dividend.

Among the numerous dividends of manufactories through Maryland, we notice 25 per cent profit on the capital stock of the Hartford Manufacturing Company, and most of the stock quotations are largely above par.

Rhode Island New Coal Vein.

The Pottsville Enquirer says that a specimen of this coal looks exactly like Pennsylvania coal dirt frozen up in heaps. Some of it kindled at a good heat of wood, and burned out in a few hours, by gradually fading at first and then more gradually loosing what remained of its lustre and heat. The residuum was about the same bulk as the coal; and on examination, it proved that except a thin layer which left a closely adhering reddish ash, the mass was unburned, presenting the same dull blue-black appearance inside as before combustion.

Anthracite Coal.

When a piece of anthracite coal was first brought to Prof. Mitchell for experiment and opinion, he tried to burn it in all his wood stoves, and failed to produce ignition and from these experiments he gave his candid opinion that when the world was to be burned the anthracite coal beds were to be the only noncombustible materials in old Pennsylvania.

The narrowest part of the Atlantic is more than one mile deep. In other parts it is unfathomable.

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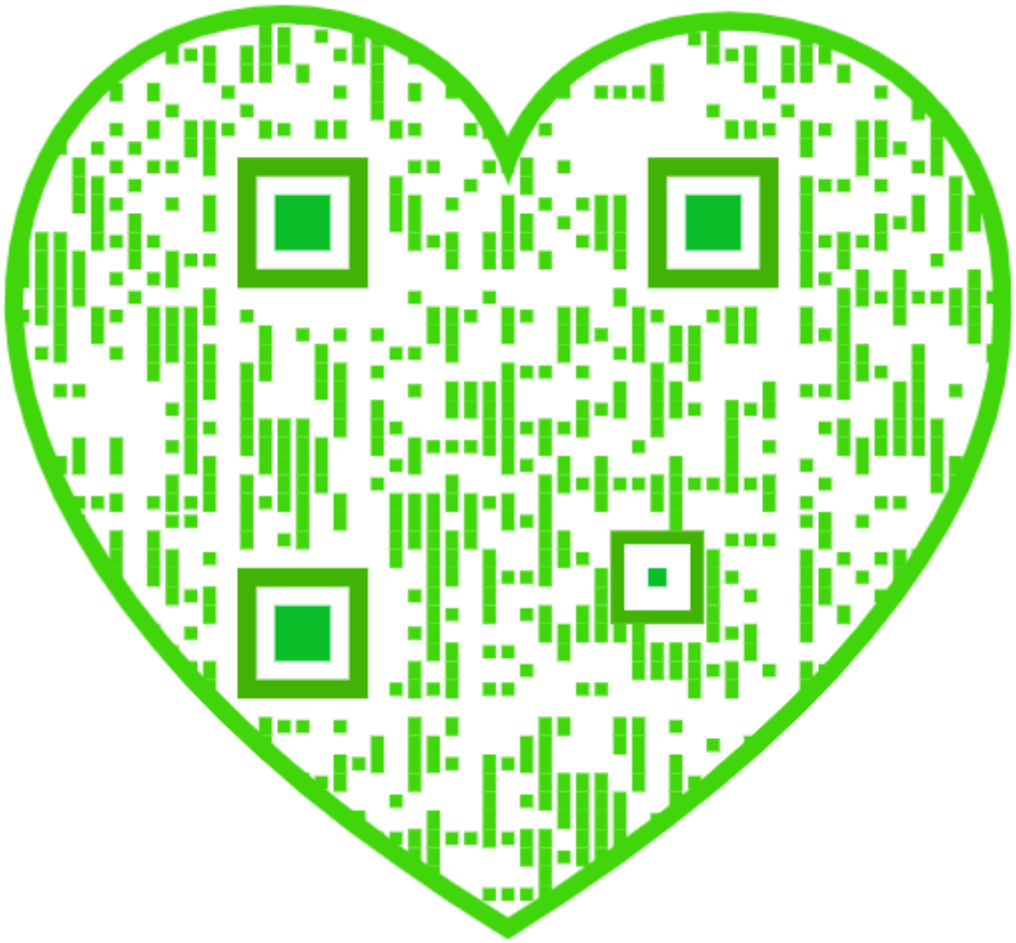

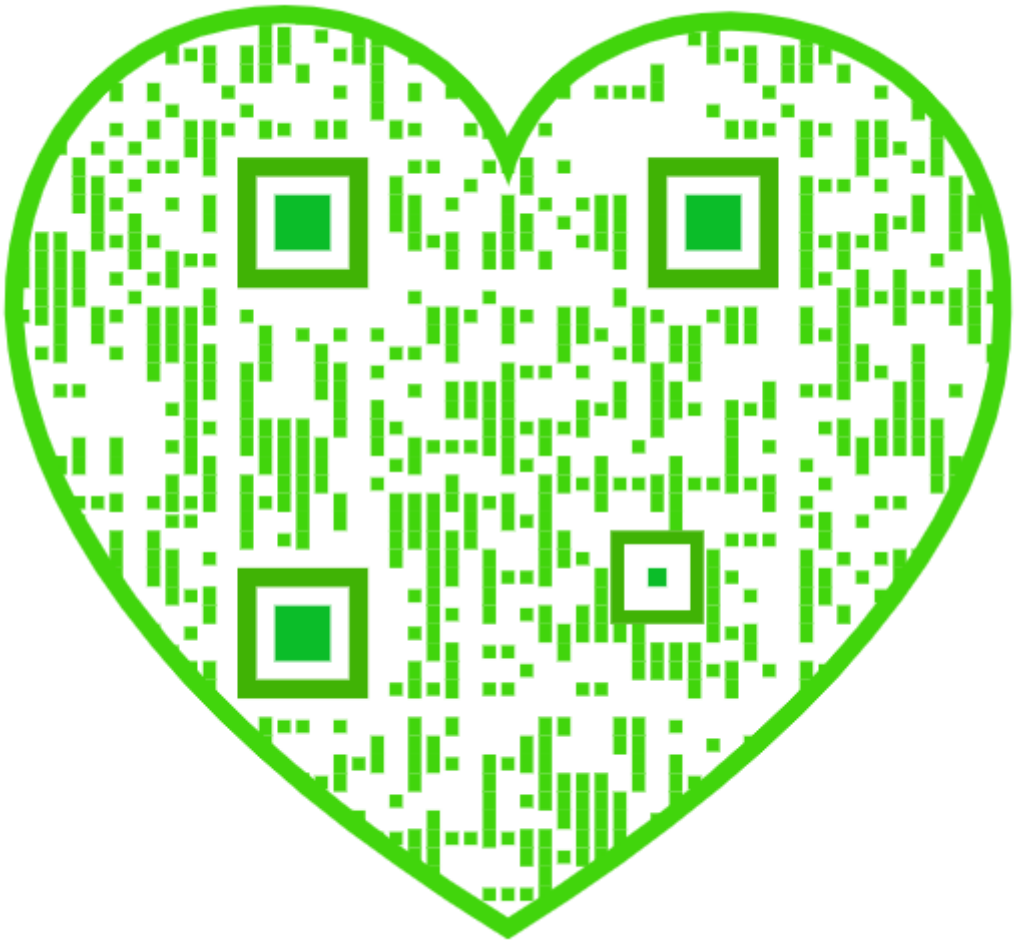

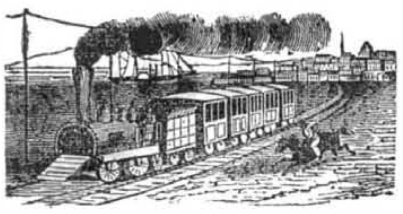

New Machine.

A new and valuable machine for the laying off the wet sheets of paper as fast as it is manfactured, has recently been invented and patented by Mr. George L. Wright of Springfield. The first one yet constructed is now in operation at the paper mill of the Messrs. Ames, and is well worthy a visit. The number of hands saved on each machine for manufacturing paper is three, and the work is accomplished with far greater precision and without waste. We see no reason why the machine in question cann ot be applied with equal advantage to the Napier printing presses in laying off the wet sheets as fast as they are printed.

The progress making in the perfecting of machinery is exceedingly rapid. Quite a number of machines have been constructed in this town, within the past year, two of which are doubtless known to our readers, viz: the machine for cutting staves, mortices, tenons, &c., and that by which stone is dressed and cut with far greater accuracy than by hand. The inventors of all these machines will doubtless receive, as they should, handsome remunerations.—*Springfield Republican.*

Hot Air Flues.

It ought to be known everwhere, that the fire in Beck & Co.'s store in Broadway, this city, recently, was caused by the omission, in building, of the tin lining to the hot air flues coming up from the furnace in the cellar. These have been extensively omitted lately, we believe, as unnecssary. In this case, the bricks became so heated, as to set the adjacent wood on fire. The fire spread very rapidly after it burst into a blaze. Although there were no less than sixty clerks in the immense establishment, it was impossible to subdue the flames without calling in the engines. There was a loss of $50,000 in a very short time. Everything about a building should be secure and nothing left to probabilities.

Deafness.

M. Bonnafont, of Paris, a military surgeon, gave an account at the January session of the Academy of Sciences, of a method employed by him in cases of deafness, to ascertain whether the nerve of sound has lost all its susceptibility. He has ascertained that the skull is a good conductor of vibration, and that, if it be struck by vibrating objects, the nerve of the ear is acted upon whenever its susceptibility has not been entirely destroyed.

A Silver Cradle.

It has generally been thought a great piece of good fortune to be born with a silver spoon in one's mouth: but it appears from ancient records of Liverpool, that a child of a Mayor of Liverpool, born during his mayoralty, is entitled to a still greater piece of good fortune—a Silver Cradle. The present Mayor has had an accession to his family, and hints that he will insist on his rights.

Degrees.

Astronomers calculated distances by the following rule; All circles were divided into 360 parts or degress. Any other uumber would have done, had mathemattcians chosen and hence the French divided their circles into 400 degrees, but the Englishman, thinking the first trouble the least, sought for a number that would divide into halves, quarters and eighths, &c., without fractions; thus making many calculations much easier than by using other numbers.

British Tea.

The government of India have resolved to allow £40,000 a year, for some years to come to be bestowed on experiments on the cultivation of tea on the banks of the Beas, in the newly acquired Sikh dominions, and in Simla districts. Sir J. Davis has been directed to procure a supply of seed, and to send from some of the first tea gardens in China some of the best cultivators that can be found.

Wood Set on Fire by Steam.

Mr. Braidwood, Superintendent of the London Fire Engine Establishment has stated in evidence before the House of Lords that from observation, he believes that in many instances timber by long exposure to heat not above boiling water, is brought into such a condition that something like spontaneous combustion takes place. It may take a long time he said, eight or ten years, from the heat of pipes used for conveying steam, hot air, or heated water to bring wood into this state that may be in contact with these pipes, so as to induce the actual ignition of the timber. But Day & Martin's blacking manufactory in London was burned down in 1844, from wood spontaneously igniting that had been a long time exposed to heat of warm water pipes and the temperature of the water never was above 300 degrees.

Smith's Yea and Nay Machine.

The machine of Mr. Smith of Baltimore, for taking the yeas and nays of Legislative bodies, has been submitted to Congress and referred to the Committee of Public Buildings, This is the machine which was noticed some time ago in the Scientific American. Mr. Smith offers to erect it in the house of Congress for $3,000. It would soon save the money in a saving of time.

Ice in London.

There is an enterprising Yankee in London who manages the ice business with immense profit to himself and the company with which he is connected. He presents himself as the agent of the American Ice Company; he has a patented Ice Safe, which he leaves throughout the City at the houses of the gentry and others, from whom he receives for each safe one or two guineas a year, supplying them also with ice, which he receives from a Company in the United States. He is coining money.

Mind Small Things.

Pick up that pin, it is worth saving. And that rusty nail will come in play. A cent is a small amount; but a hundred make a dollar. Money seldom comes in large quantities. Pick it up littte by little, if you would become rich A copper a day amounts to more than three dollars a year.

Town Swallowed by an Earthquake.

The London News says that "the Neapolitan steamer Capri brought intelligence from Syracuse that the earthquake which was felt there on the 11th had laid the city of Augusta in ruins. The first shock was felt at 1 P M., and was so violent that all the people fled from their houses. A following one, a few minutes afterwards, destroyed the whole place except 27 houses: the whole place sunk and where it formerly stood there was no bottom at 50 fathoms. The last accounts from Syracuse state that 35 dead bodies had been found, and 59 wounded recovered from the ruins.

Extension of a Patent.

On the petition of the patentee for an extension of seven years on a patent granted to Solomon Merrick, of Springfield, Mass,, which expires on the 17th of August, a hearing will be had at the Patent office, on the first Monday in July.

Shutting Up Shop.

While many of the manufact uring companies of New England are reducing the wages of their operatives, and curtailing their manufactures, we notice a statement that the directors of the cotton factories at Uxbridge are about to take measures to close their mills, they having a very large amount of goods on hand.

A New Cure for Consumption.

A Mr. Des Champs has recently addressed a letter to the Academy of Sciences, (Paris,) in which he asserts that he has discovered an infallible remedy for diseases of the lungs, even when tubercles have formed. He has forwarded his receipe, and sent security to the value of 70,000 francs, to be forfeited in case the efficacy of his remedy should not be established by experience.

The telegraph between New York and Halifax will be compl eted by the month of August next.

A Valuable Invention.

A most valuable discovery has been made in Paris, by M. Leclere, a house painter, in the successful substitution of the white of zinc, for white lead. He states that the substituted product, independently of its use being unattended with the dangers to health caused by white lead, is of a more pure white, and offers a better resistance to the causes of change of color which affect the white obtained from lead. He adds that he employs two hundred workmen, and that since they have used the white of zinc not one of them has been attacked by the painter's cholic, or by any other of the diseases caused by the use of white lead.

[Our painters should adopt the use of this substitute immediately.

Alleviation from Cough.

Persons using stoves for warming apartments will find that a small piece of common resin dipped in the water which is placed at a stove, will add a peculiar property to the atmosphere of the room, which will give great relief to persons troubled with cough, who breathe the atmosphere of the apartment The heat of the water is sufficient to throw eff the aroma of the resin, and gives the same relief as is afforded by a combustion of the resin. It is preferable to combustion. because the evaporation is more durable. The same resin may be used for weeks.

American Journal of Agriculture and Science.

We have received the March number of this valuable monthly. It is full of interesting matter to the agriculturist and all those who have a taste for good scientific matter. C. N. Bennet the famous scientific and practical farmer is Editor, and Prof. Emmons is one of the constant contributors There is an excellent article on the Blossburg Coal Mines by J. Tremper, worthy of attention. The article on the "Cast Iron Plough," however, should have been credited to the N. Y. Tribune. Price 2 dollars per annum. Published by E. H. Pease, Albany, N. Y.

Mercantile Honor.

Edward Wiley, Esq., a merchant of Savannah. who failed in business some years ago, and compounded with his creditors by an equal distribution of his means among them, has since discharged the moral obligation resting upon him by paying up all the arrearages from which he had been legally discharged. His creditors to mark their high sense of Mr. Wiley's mercantile honor and moral integrity, have presented to him two elegant silver pitchers, with appropriate inscriptions.

The Coal Trade for 1848.

The colliers of Pennsylvania expect a good trade this year, and by the Pottsville Emporium we learn that vessels will be more plenty for cargoes, as in Maine alone, more than double the number of vessels which ever has been finished in one year, was built last season, all of which will be ready for the carrying trade of this year. Hence we also expect coal at a somewhat reduced price next winter.

New Invention.

A Capt. has invented a machine to measure the depth of the ocean, by night or day, and to tell the nature of the bottom and other curious things. Also a sort of balloon, to go into the higher regions of the air, and observe the solar clouds, whose existence was not known till 1842 —*Ex.*

A balloon story, truly.

Lusus Natura.

The wife of a respectable carpenter in Jersey city, was, on Thursday last, delivered of a fine healthy child, who, although beautiful in form and feature, presented the most extraordinary spectacle of a head, which, in lieu of hair, was covered with feathers, resembling those of a canary bird. The mother and child are both doing well. A feathery story.

Envy.

Whenever we behold a man endeavoring to injure the character of his neighbor who has done him no wrong, we consider that man an enemy to his race, and if he is a professor of religion, we consider him as having "robbed heaven of its livery to serve the devil in."

The French Telegraph.

In France the electric telegraph is a monopoly of the government, and so is its use—the latter being confined exclusively to the government. Neither individuals nor the press can have access to it, or employ it, for love or money. This gives a power to the government over the people greater than a hundred thousand increase of its soldiery, and to any speculator in connection with, or in the confidence of the government, the power of amassing his millions at the expense of the less favored public.

The Eclipse.

As the Sun on Sunday morning, says the Boston Traveller, was completely obscured by clouds until 9 o'clock, the astronomers in Cambridge and in this city were unable to make observations as they intended.

Temperance in Europe.

A movement is now making in Paris for the formation of a temperance society in the English and American fashion. Many eminent persons are interested in the affair.

Long Sea Weed.

Sir George Simpson in his journey through the world, said that near Calvert's Island, he saw a sea-weed growing to the surface of the ocean from the depth of thirty or forty fathoms.

Gov. Briggs, at the Temperance meeting in Faneuil Hall, Boston, on Tuesday last, stated that the report of the Committee appointed to inquire in regard to the idiots in the Commonwealth showed that there were from 1,200 to 1,300 of that unfortunate class, and also the astounding fact, that from 11 to 1200 of them were born of drunken parents.

The editor of the Yorkville, S. C. Miscellany has had such a crowd of subscribers come all at once to pay up, recently, that he was obliged to "turn some off, for want of time to attend to them." He begins seriously to think of indulging in the luxury of butter on his potatoes.

The sweepings and rubbish of Paris are sold to the persons who remove them, at their own expense, for 500,000 francs. After having been rotted in pits for that purpose, the soil is sold at the rate of 3 and 5 francs per cubic metre, and produces about the sum of 3,000,000 francs.

An Oriental prince was afflicted with a nervous disease, which, his physician told him could only be cured by wearing the shirt of a happy man. A search was made for such a man, but, alas for the prince, it was found that the happy fellow had no shirt.

Geo. K. Pardee of Wadsworth, Ohio, says in a letter to the Cleveland Plain Dealer, that Ex-Governor Seward, and Hon. Christopher Morgan of this State are interested with Wood's heirs equally, in the benefits proposed to be conferred by the renewal of the iron plough patent.

A mammoth manufactory has been built in Ranstead court, Philadelphia, by Hulings Cowperthwaite, It is the largest building of the kind ever erected in Philadelphia, and is intended for machine making, book binding, lithograph printing, silver-working, &c. Its different apartments are capable of accomodating twelve hundred operatives.

The French steam corvette Cuvier, was destroyed by spontaneous combustion of her coals, off Majorca, on the 26th Jan. Her officers and crew escaped on board a Spanish vessel.

We are indebted to Senate Dix, for important Congressional documents, also R. H. Pruyn, Esq., of New York Legislature, for valuable Legislative papers.

The india rubber springs of F. M. Ray of this City are now being used on the Worcester rail road, Mass.

The project of a Railroad from the Erie road at Newburg to Hartford, is agitated in the Connecticut papers.

A bill to give laborers a lieu upon railroads has been rejected in our Senate. We are sorry for this.

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For the Scientific American.

Carpeting.

(*Continued from our last*)

A desire for something in the interior of a dwelling analagous to the soft clothing of the external world, seems to be generally felt; for in all states of society, attempts are made to remove the hardness and unseemliness of the floor. Among the poorer nations, these attempts are confined to the mere dormitories, but, as advances are made in wealth, the mat and carpet begin to appear. The softness of the turf, and more than its smoothness having been attained, it was natural also to imitate its embellishment; for this purpose several distinct kinds of carpet texture have been contrived. On one of these, the ingrain, we have already reported an immense improvement, and proceed to describe a no less striking improvement on another, the Brussels carpet

The Brussels carpet is distinguished from the common ingrain, by having a *raised pile*, and by the circumstance that the figures and colors are entirely produced from the warp The pile is raised by inserting a wire between the body of the warp and the previously raised coloring threads. These threads descend and are fixed by the weft, which is of linen, two picks being given before the insertion of each wire, and these picks are called "binders," and after a few repetitions of the process, the wires are withdrawn; taking care that they be not drawn out too near the face of the cloth; otherwise the looped warp would become stretched, by recovering the position in which it was before the wires were inserted.

The Wilton carpet differs only in this, that the pile is made somewhat longer, and cut in the manner of velvet. Were the colored warp however, raised into pile at each stroke the web would have simply a striped appearance, and if it were raised only at intervals, the figure would be given in relief, but still would be merely striped In order to produce a properly colored pattern, several colored yarns are arranged, *so that any one of them may be raised into pile.* Their number is generally five and these constitute what is called "five covers," so that, by their irregular ascent to the surface, the striped appearance is almost broken up. Still, however, the web is essentially striped, and though the designer be not nearly so hampered as in the Kidderminster texture, he is yet seriously incommoded in his choice. Let us suppose a board painted in minute colored stripes. After these have dried, let another coating of colored stripes be laid on, and so on for five coats, each differing from the preceding; the painter may now form an idea of difficulties encountered by the "carpet designer,"—let him set to work, by scraping away the different coats, to produce a pattern. But there is another annoyance; in order to produce the smallest speck of any particular color, a thread of that color must traverse the whole pattern; and that thread may displace some other which would have been advantageously brought in elsewhere. On account of the very different rates at which the colored threads are taken up, these cannot be wound upon one beam, but have to be placed upon a bobbin by itself.

To remedy the inconvenience of this texture the (Brussels carpet) Mr. Richard Whytock, of Edinburg, contrived a method of partially dyeing the yarns; but we cannot fully understand the value of the contrivance till we have glanced at another kind of carpet texture.

The *Turkey carpet* is the simplest in its texture of all carpets, and at the same time is almost unlimited in the choice of colors. Let us suppose ourselves seated at a common loom, and that immediately after having thrown a pick, we commence to tie on every thread of the warp a small bunch of colored worsted yarns, varying the color to our fancy. This completed, let two or three picks be thrown, and well driven up; and then another row of colored worsteds tied on. It is clear that *in this way we could produce any pattern*, and that no more of any particular color is wanted than is sufficient to produce the required effect; nay more, the colors being put on by hand, we would not be compelled to reiterate the pattern at each stated distance. Here we have every advantage that we can wish for, excepting the important one—rapidity of formation.

Whytock's method supplies to all the advantage of the Turkey carpet, a rapidity of weaving greater than that of the Brussels fabric. His method may be described thus: If for the five colored yarns of the Brussels carpet we could substitute one yarn dyed of the requisite color at different places, we would be able to dispense *with all the apparatus for producing the pattern*: could make the web with only one body and work it as a simple velvet. The only difficulty would then be in the dyeing of the warp threads.

Before concluding we would draw attention to a subject of great importance to society in general. A strong prejudice sanctioned by an old proverb, exists against those who turn their attention to several branches of the arts. Yet it is a fact, that almost every improver has been Jack of a good many trades; nay, an acquaintance with a variety of operations is essential to the invention of new ones; and very often prodigious improvements are effected by the transference of a process from one art to another May we be allowed to hint that the triple carpet is one of those generalizations so often found in scientific researches, and that its inventor Thomas Morton, appears to have extended his studies far beyond the subject of carpet weaving. Mr. Whytock's carpet again bears on the face of it the necessity for a knowledge of the arts of *dyeing weaving and scheming*; for no one not intimately versed in these could have conceived, or having conceived, could have carried the idea into effect.

Another idea exists, that the happening upon new discoveries is a matter of chance, and some appear (we judge from their conduct) that the less they know of a subject the more apt they are to alight on something new; as a bad swordsman trusts to that very circumstance for outwitting his antagonist. Once in a century, indeed, one may find by chance, some valuable process; but the great mass of our current inventions are the fruits of assiduous and well directed exertion; and the mind, even more truly than the body, must earn its bread in the sweat of its brow.—GILROY.

(*To be continued.*)

The Moon.

Those who, for the first time behold the moon's surface through a powerful instrument, will always be disappointed in its appearance. There are mighty mountains on its surface. There are deep bleak cavities, some perhaps fifteen, twenty, forty, and even sixty miles in diameter, and sinking below the surface seven and eight thousand feet. Out of these, mighty rocks arise two thousand feet above the level of the valley, casting their black shadows upon the plains below.

By the lights and shadows which show themselves to the eye, astronomers measure the height of these mountains, by remarking the relative position of the sun and the earth. They mark the extremities of their long deep shadows, and find, that as the sun slowly rises, the shadows by degrees recede towards the base of the mountains; and when noon-day arrives they entirely disappear. Then as the sun begins to decline on the other side, the same dark shadows are cast in opposite directions. They watch these movements, till they ascertain with perfect certainty the character of the object which casts the shadow, and then measure the height. The moon has no atmosphere—at least not such a one as will compare at all with ours. The Moon's atmosphere if indeed it have one can be no denser, than the extremely rarified air, left in the most perfect vacuum yet produced in an exhausted receiver. It cannot sustain animal life—it cannot support clouds And for the reason that the moon has no atmosphere, there is no gradual fading away of the light as the Sun sinks deeper below the horizon—no soft, mild, and lovely twilight, such as sheds a holy serenity over our favored globe. There used to be many superstitions about the moon. Throughout the east the opinion was common that the moon-beams were deleterious—injuring the sight and defacing the countenance of those who slept exposed to them. The fishermen of Sicily even now, cover their fish at night because they fear the moon would putrify them but this is known to arise from the absence of clouds on a moonlight night, when the fine clear sky favored the radiation of heat, by which bodies became colder than the surrounding air, and hence the mischief of putrefaction. Epilepsy and insanity were supposed to be greatly influenced by the moon; but even these might possibly be accounted for as easily as the first charge laid to our silvery satelite.

Figure of the Earth.

Before the time of Newton, it was never suspected that the figure of the earth differed in any way from that of a perfect sphere, excepting the small irregularities produced by the mountains and vales. The first circumstance which lead to the determination of its true figure was the discovery that the pendulum of a clock, used for astronomical purposes, and therefore required to keep perfect time, did not vibrate so frequently at the Equator as at Paris. Other trials were made which proved that the decrease was gradual, from the Equator to the poles. Here was a new field for the philosopher's investigation. Newton, ever vigilant in scientific pursuits, took the matter in hand, and eventually framed those sublime calculations by which, as Fontenelle, remarked, "He determined the true figure of the earth without quitting his elbow chair.

Spurious Opium.

A case was tried in Boston a short time since, in which the plaintiff demanded back the money he had paid for a large quantity of opium. He proved that although the article appeared so like opium, that it was impossible to detect its bad character by ordinary examination, yet, in reality, it was entirely worthless, being composed of that part of opium which is thrown away after extracting the morphia from it, with an addition of meconic acid, and the other solids and alkalies belonging to opium and some powdered marble, a very ingenious compositioon. The Judge ruled that the bill was a guarantee that it was opium. If it was not opium, the plaintiff was entitled to recover, and the jury gave a verdict for the amount of the purchase money with interest.

Steam Wagons.

Two persons were recently travelling on one of our roads in the interior, in a carriole, smoking cigars, from the fire of which some straw at the bottom of the wagon became ignignited. The flames soon drove them from their seats, and while they were busy in extinguishing the fire, a countryman, who had been for sometime following them on horseback, alighted to assist them. "I have been watching the smoke for some time." said he. "Why then, did you not give us notice?" asked the travellers. "Well," responded the farmer, 'there are so many new-fangled inventions now a days, I thought you were going by steam!"

Woman.

There is poetry and inspiration in this word and when we perceive a mawkish fastidiousness regarding it, we cannot but regard the signs of the times, with a contemptible sneeze for politeness and pallavers. There are no women now a days—all are *ladies*, —and the men *gentlemen*,—oh dear, hold this smelling bottle to my nose, a mechanic has passed between me and the wind.—The Hon. John Donkey took breakfast at the Hon. Lady Snifters last Wednesday morning at noon, and with the most enchanting affability, she languishingly asked him if he drank cream (New York cream, chalk and water) with his Mocha? The Hon. Mr. Donkey brayed in a most gallant manner, "all things good, most noble lady."

Can't Understand It.

We cannot understand it how it is that delicate young ladies, too delicate to run up and down stairs in their own houses, are able to dance down the strongest man in a ballroom. 'Tis a phenomena of nature which no one seems capable of giving an explanation What young girl ever refused a handsome partner at five o'clock in the morning, on the score of being "so tired?"

Foreign Scientific Miscellany.

We learn from our foreign correspondent, that the Lords of the British Admiralty have paid a visit to the naval establishment at Woolwich, in order to inspect the new Saw Mills completed by Mr. Rols, the contractor. This invention of Mr. Cochrane, of the United States, is the only one which may be said to be successful for the manufacture by machinery of the timbers employed in the frame work of vessels; and the erection just completed at Woolwich Dockyard is the only one on Mr. Cochrane's plan in England. The machine requires three persons to tend it while at work—one at each of the saws, and a third to direct the bevelling motion.

Hydraulic Telegraph.

The following is an account of the hydraulic telegraph which we noticed some time ago. The telegraph is produced from the action of water, and has been patented by a Mr. Jewett. It appears very simple and ingenious, and is likely to excite some attention.—The model now exhibiting consists of a small tube with a piston and indicator at each end. An upright plate contains the letters of the alphabet, the first letter being at the top of the plate at one station and at the bottom of the plate at the other. Thus if a telegraph of this description were laid down from London to York, the indicator, if pointing to the letter A, would be at the top of the plate at the former place, and at the bottom of the latter.—As the one piston descends, the other, from the pressure of the water, ascends in exact proportion, each indicator pointing to the same letter.

The Ventilometer.

At the Royal Institution, in London, on the 4th ult., an instrument, invented by a French naval officer, in high command at the port of La Rochelle, where it has been tried during more than three years, was described. It foretells the changes that take place in the electro-magnetic currents; so that during the 24 hours succeeding any period of observation the wind indicated by its needle will certainly blow—the change generally taking place between 12 and 18 hours. The instrument is not acted upon by the light breezes, but by any strong wind, and the inclination of the needle indicates the velocity of such winds up to violent tempests.

Traveller's Door Fastener.

Among the various inventions which have have lately been patented in England, is one termed a traveller's door fastener, which is composed of two small metal plates formed into a wedge by the insertion of a piece of wood between them, while the under plate is fitted with two small spikes that catch the floor. The sharp end of the fastener is thrust under the door, and is more firmly fixed by every attempt to enter the room, while a cord carried to the bedside enables a person lying in bed to withdraw the wedge, and thus admit a visitor.

Railway Alarm.

Captain Fitzmaurice, of Ramsgate, England, has invented a very simple and effective railway alarm. It consists of an alarm bell placed on the tender. This bell is kept silent by a piece of leather, on which it is pressed by an iron pin. This pin may be pulled out by drawing a string; and when released by this means, the bell by a strong spring is violently rung. The string passes loosely along the under edge of the roofs of the carriages on the outside; and, as it is not required to be kept tight, no more is necessary than to haul in the slack from any part of the train, and release the pin, when the alarm is given.

[This is old on American Railroads.

Knitting Stockings by Steam.

A number of influential inhabitants of Ipswich, England, have introduced into that town an important branch of industry, likely to give employment to a large number of persons. Machines are now as work knitting stockings by steam. The work is done with beautiful accuracy. One young person can attend to three machines, and each machine will knit one stocking in three hours.

The deficiency in the consumption of tea last year was 269,000 lbs. in Dublin and 240,000 lbs in Belfast.

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New Inventions.

Improvement in Steam Engines.

Mr. M. P. Mack, a good mechanic of Canandaigua, Ontario Co., N. Y., has made a very neat improvement in the working of valves of the steam engine. No eccentric or valve rods are used as in the common way. The piston works the valves independent of all action of the piston rod. This is done by peculiar levers that are struck by the piston itself and no slide rod is seen at all. He has had one engine of a horse power in operation, running for about two months and it works beautifully, and but for the clicking of the levers, no one could imagine how the valves operated. We may be able to present an engraving of it in some future number. Measures have been taken to secure a patent.

Cotton Yarn covered with Wool.

One of our exchanges states that a gentleman in Providence, has perfected machinery by which slack-twisted cotton warp and filling may be covered with the fibres of wool or worsted, so as effectually to conceal the original thread. Mr. Law, of Baltimore, Md., has a machine for this purpose which has been patented for three years.

New War Steamer.

We have been informed that Mr. Paine, the great optician, has on the stocks at Worcester, Mass., a model marine steamship which will be about twenty tons burden, constructed on a new principle, and designed for the use of the government. The machinery is all below the water line, and the propeller is submerged, and to be incapable of foundering, and to go at the rate of 25 miles an hour. The speed we believe is questionable.

Yea and Nay Machine.

A machine for taking the yeas and nays in legislative assemblies has recently been invented by Robert E. Monaghan, of Chester county, Pa. It is said that it will take the vote of Congress in two seconds!

Iron Chimney Pieces.

Mr. Samuel J. Thompson, of Lawrence, Mass., has projected the making of beautiful cast iron chimney pieces as a substitute for wood and stone. They can be made of any form, moulded of the most beautiful patterns, to give them a handsome appearance. They are made of several pieces which are put up with screws, and need not be so heavy as marble, but made chaste and beautiful in all their proportions. They are to be covered over with proper varnish, or bronzed or marbled, and can be made to suit any apartment. They will yet take the place of many materials now used for that purpose.

New Cloth Measurer.

Mr. D. R. Ambrose, of Portsmouth, N. H. has invented a new machine for folding cloth which is very simple in its construction and folds and measures the finest cloth with ease and speed. This machine will be very important to Calico Print Works and Bleaching Works, and the inventor believes that he will be enabled to make it much cheaper than any now in use. Measures have been taken to secure a patent, and we may be able to present an engraving of it in a future number.

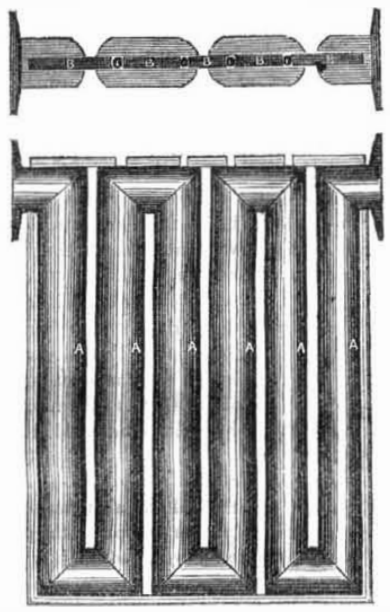
New Roller for Fancy Printing.

Col. J. H. Foster, editor of the Daily Dispatch, Pittsburg, has taken measures to secure a patent for an invention, that promises to be as much better for the purposes intended, as are common rollers over the old fashioned printers balls. The design is to distribute by one movement numerous colored inks upon a form a process now of much trouble. The machine is composed of three rollers, the first one whole, and the two last sectional.

These rollers are cast in sections, of various widths to suit the lines of the job type—and are secured by screws upon stationary rods upon which they revolve. At the end of the roller rods are placed guides, with small wheels attached to the lower part, three rollers are placed in the frame, the front one being full length, for rolling the border, the others in sections to suit the various lines, and the top and bottom of border. The small guide wheels run in a dove-tailed-groove railway attached to each end of the press-bed, in which are placed elevators and depressors, by the action of which upon the rollers they are allowed to ink the form or raised upon it as desired by the pressman. Of course the front roller after inking one side of the border, is raised above, and passes over the centre of the form without inking it, untill it drops upon the other side of the border—the other rollers pass over the side-border without inking it, but roll the centre of the job, and the top and bottom of the border, the elevators and depressors being arranged in the grooves to produce this varied effect.

These are the main features of the machine which is termed the "Polychromatic Rolling Apparatus," The present mode of printing colored jobs is tedious and expensive, nnd the mode which is thus described will no doubt produce quite a change in this department of the printing business.

New Furnace Grate.



This is a new Grate for Furnaces, the invention of Messrs. Chapman & King, of Adrian, Lenawee Co., Michigan. It is composed of a series of cast iron tubes or pipes with broad strong flanges on the outer edges. The flange is for the purpose of resting solidly on the bed of the furnace arch, so that the tubular grate may also answer the purpose of a furnace frame. The object of this grate is for a water conduit to supply a steam boiler. A proper flange for coupling with another pipe, is cast upon the end pipes or extremities of the grate. The one end is connected with the pipe of the force pump of an engine, and the other with the supply pipe of the boiler. The water, therefore, which goes to supply the boiler must pass through the whole of the pipes or hollow bars of the grate and must absorb a great amount of heat in its winding way through them. Experiment has proven this to be a fact, the water entering the boiler at a great degree of heat. For example: If the grate is 2 feet wide and 4 feet long, with 6 pipes in the grate leaving 6 inches space between the pipes, the water will be exposed to 27 feet 6 inches of top heating surface. These pipes are cast at one operation and can be cast at any strength to stand an amount of pressure always superior to the pressure in the steam boiler, which must needs be. This kind of grate can be cast of any number of pipes.—One end of the pipe only has to be plugged up afterwards. A, represents the pipes, and the upper figure is an end view B, representing the end flanges and the openings at the ends, which are for packing the sand in the moulds and for taking out the cores, and which is all that requires to be plugged up, and then the whole grate is one single winding pipe, made, if necessary, as strong as a cannon.

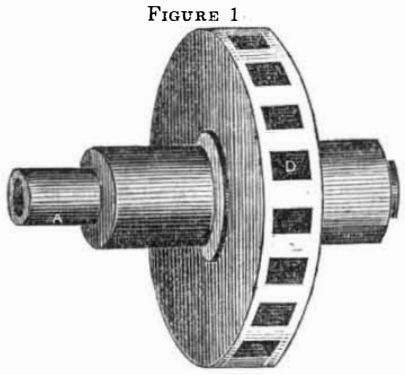
Messrs. Chapman & King have taken measures to secure a patent.

Patent Fire Annihilator.

The London Times says that it has had an opportunity of witnessing some experiments of Mr. Phillip's vapor engine, by which flames are instantaneously extinguished. The discovery certainly appears to be most simple, and, at the same time perfectly efficacious. The origin of this discovery desires to be recorded as a proof of what may be accomplished by a man of genius and observation, who labors for the advancement of science in that best school of knowledge, the laboratory of nature. We are told that Mr. Phillips, the inventor of this new engine was first led to prosecute his researches in this direction in consequence of observing that the vapor which issued from a volcano during an eruption had the effect of extinguishing flame the moment it came in contact with it. He accordingly set about examining the composition of this vapor, and the present invention is the result of his inquiries.

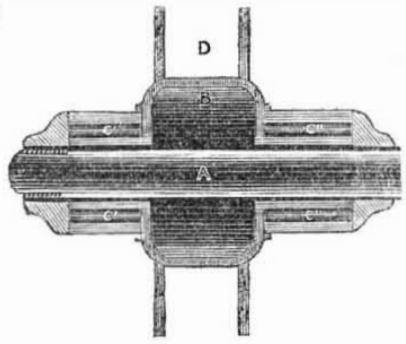
Improved Carriage and Wagon Axle.

FIGURE 1



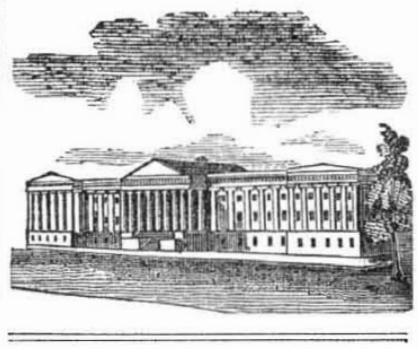
This is a new axle invented by Messrs. Foster and Baily, the inventors of the rock driller which lately appeared in our columns. The nature of it is to have the hub made of cast iron, which will be the cheapest and best substance for that purpose, and to have a sleeve on the bearing of the hub that will work into two cups on the axle, (one fixed and one moveable, filled with friction rollers. The above cut is a view of the axle and hub coupled together. A, is the axle, D, the mortice for the spoke.

FIGURE 2.



Is a sectional view, A, is the axle, and B D, the hub, B, being the inside chamber of hub. C, represents the fixed cup which is shrunk on the axle inside of the hub, and the letters represent particularly the chamber where the friction rollers are placed between the sleeve of the hub, which covers the axle, and the outside section which is the cup.—The axle is made of a diameter small enough so as to allow the sleeve of the hub perfect freedom, and let the friction be borne entirely on the outside of the sleeve and the friction rollers inside of the cup. C 1, C1, represent the moveable cup, and is the same as the other inside of the hub, only that it screws on the axle and is a perfect box covering the axle and keeping out all dirt.—The screw is made left handed so as not to be effected by the running of the carriage and at the same time it can be screwed up to regulate the exact play of the hub on the axle. The axle and hub can be made hollow or solid for strength or lightness as may be desired. By this engraving, the reader will be careful to observe the sleeve of the hub as fitted into the cup, and the axle as passing through the sleeve exactly as represented. This axle can be made cheaper by ten dollars than the patent axle now in use and the inventors who are going to patent the same, can be consulted by letter for other information, address Messrs. Foster and Baily, at Hartsons Machine shop, No. 42 Gold st., N Y.

The hub in fig. 1 was drawn too large for correct proportion for an operative model.—These axles have been considered as suitable by some mechanics for railway cars.



LIST OF PATENTS

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending March 7, 1848.

To Ansel Benham, of Belvidere, Illinois, for improvement in Blocks for Horse Collars. Patented March 7, 1848.

To James Howey, of New Pittsburg, Ohio, for improvement in Harness Buckles. Patented March 7, 1848.

To James Adams, of Boston, Mass., for improvement in Lead Pipe Machinery. Patented March 7, 1848.

DESIGNS.

To Alexander Morrison, of Troy, N. Y., for Design for Stoves. Patented Mar. 7, 1848.

RE-ISSUES.

To Henry L. Pierson, (assignee of Jeremiah H. Pierson,) of Ramapo, N. Y., for improvement in the machine for cutting and heading Wire for manufacturing Wood Screws and Rivets. Patented Nov. 26, 1836. Re-issued March 7, 1848.

To Henry L. Pierson, (assignee of Jeremiah H. Pierson,) of Ramapo, N. Y., for improvement in the machine for nicking or cutting notches in the heads of Wood Screws. Patented Nov. 28, 1846. Re-issued March 7, 1848.

To Thomas J. Sloan, of New York City, for improvement in machinery for cutting the threads of pointed Screws. Patented Nov. 24, 1846. Re-issued March 7, 1848.

INVENTOR'S CLAIMS.

Moulding Glass.

By Joseph Magoun, of East Cambridge, Mass., (having assigned his right, title and interest in said improvement to the New England Glass Co.) Improvement in moulding and pressing Glass. Patented 25th September, 1847. Claim.—Having thus described my invention, that which I claim is the hereinbefore described manner of making the foot of a glass goblet, or other article of like character, whereby I am enabled to manufacture it without the usual mould marks, or impressions of the joints of the moulds, viz. by casting the said foot in the mould in the shape of a hollow cylinder, or inverted cup or bell, shaped as above described, or any shape approximating thereto, and in combination with afterwards opening the same, or making it into a circular disk, by means as above specified. I also claim the hereinbefore described mode of making the mould, in order that the body part of it may be made in one piece, and without any side joint or joints, by which any impressions of such joint or joints will be produced on the body of the glass article in casting it in the mould, the said mode of making the said mould being to construct the opening of the said bottom of the body of a size sufficient to admit the shank and foot part of the glass article to be drawn upwards through it, as above explained. I also claim the combination of the two series of cams, as before described, with the bottom plate, cam plate, of the mould and core of the foot, the same being for the purpose of elevating the glass casting from the core, or depressing the core from the said casting, in the manner and for the purposes as above specified.

Bridges.

By James F. Gassaway, of Marietta, Ga.—Improvement in Bridges. Patented 18th September, 1847. Claim.—What I claim as my invention and desire to secure by letters patent, is uniting the successive spans of the bridge to each other, and causing them to cooperate by the combination of the rods with the cross timbers and the bolsters, or transverse plates resting on the piers as herein set forth

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NEW YORK, MARCH 18, 1848.

To Subscribers.

We have now reached the middle of volume 3 of the Scientific American, and we take this opportunity to tender our thanks to our subscribers for the interest they have taken in extending our circulation. More than two thousand new subscribers have been added to our list during the last six months, and the number is augmenting daily We have the largest circulation of any other scientific and and mechanical paper in the world. Our facilities are such for obtaining all kinds of information that no other publication of the same nature can surpass, if equal, the Scientific American in the amount of original scientific articles that appear from week to week in our columns. We take much pleasure in being able to state, that from the manner in which our business and paper is conducted we have become intimately acquainted and connected with our subscribers by the most friendly feelings. Solid and useful information is taking deep root in the hearts of all those who come within the very influence of any of our subscribers, and a right and just estimation of our paper's worth is not estimated merely by its bulk, but by the value of its contents. It is not by the size of a paper that we are to judge of its value any more than we would judge the quality of a piece of cloth by its measure. We have a great number of valuable correspondents—some of the ablest in the Union. Our paper has now become the historian and recorder of American Inventions. We shall publish an index with the last number of this volume, and on this account it will be the best scientific paper for binding in the United States Our subscribers will perceive that the Scientific American has been steadily improving in manner and matter. As our subscription list has increased, we have been enabled to improve our paper, and this we have done most materially during the past year. Numerous complimentary letters on this account have flattered us not a little. An opportunity is now presented for a renewal of half yearly subscriptions, and to those who desire to possess the most useful and best scientific and mechanical paper in the United States, we would say send in your subscription and induce a neighbor or two to send with you.

Marine Engines.

The engines in ocean steamers are called Marine Engines, and are peculiar to the ocean steamers, it being indispensible in them to have the weight of the engines as far as possible in the hull of the vessel, so as to guard against accidents, and too much rolling, as would be the case if the engines were arranged like the river steamers.

There is a difficulty in working marine engines in consequence of the hold of the ship not being deep enough to allow of a long stroke engine. To obviate this there are several varieties of engines—some working in an inclined position—others, by a direct action from the piston head to the crank, and by the revolving or oscillating engines, so called from the cylinder moving on trunnions to accommodate itself to the motion of the crank. The first engine of this kind was made by Messrs. Renie & Sons, of London, and Joice's patent marine engines are built upon this principle. The steamer Cricket, that exploded in London last summer, had an oscillating engine. The oscillating engine is very simple and beautiful in its operation.

Audubon.

It is said when this distinguished naturalist arrived in the city of Cincinnatti, his poverty was so extreme that he humbly requested permission of a drayman to pull a few hairs from his horse's tail. The novel request was granted, and these hairs Audubon manufactured into rings which he disposed of for a few cents, and thus laid the foundation of fortune and success in life.

New Shot Tower.

Mr. Kennet, of St. Louis Mo., has recently constructed a new shot tower, which is thirty one feet in diameter at the base, and seventeen feet at the top, and one hundred and seventy-five feet high. The lead is conveyed by an endless chain into the upper story, where it is melted, and whilst in a liquid state, is passed through a ladle seive of the size of shot intended to be made, and falls the distance of one hundred and fifty feet into a cistern of cold water. This gives the globular form to the drops, which are chilled before reaching the water, and entirely cooled by the time they get to the bottom of the cistern.

From this cistern they are conveyed into a heated drum in which a spiral wheel brings them all in contact with heated air, and thus dries them. They are then passed into a revolving cylinder, in which they are polished, and from thence passed over a succession of inclined planes or tables, about six inches apart. In passing over these tables, the imperfect shot drop between the tables, and those which are perfect roll over into the receptacle below. They are then passed into a hopper, and by a succession of seives or guages, worked also by machinery, the various sizes are separated. Each seive is then emptied into the appropriate receptacle.

Shot is formed upon the same principle of natural Philosophy as rain drops.

Carriages.

In an ordinary carriage, while the horses are in the act of turning, the face of the driver is not directed in the same way as the heads of the horses, but obliquely to them, consequently accidents often happen. Now, if the pivot could be placed further back than the position of the driver, it might enable him to be constantly in a line with his horses. Mr. Adams, of London, made an equal wheeled phæton, in which the pivot was between the driver and the box, and the sitters in the body of the vehicle; it turned with greater ease than common carriages, and had the advantage of distributing the wear and tear equally among all four wheels, by having them of equal size. Mr. Adams is the author of an excellent work on Pleasure Carriages, which can be had in this city, and which every carriage maker should have. He proposes to apply his "equal wheeled" principle to omnibuses, which vehicles, clumsy as they are, possess great conveniences to all ranks of persons, and which, he says, "is jointed in the middle, where the circular sides are made flexible, like a leathern head or hood. It will turn with equal facility in the narrowest as in the widest streets, without impeding the passage way along the interior, as the flexible sides move in a circle, and at the present moment this is the case in London. With this omnibus there is greater ease to the horses, a great facility of access and egress, perfect command of the horses, and a greater general durability.

Value of Small Things.

At the coal pits of England broad flat ropes are used to draw up the coals. These are called *tows*, and a new tow has to be added every few weeks to some of the large collieries. For many a year these old ropes were thrown aside and considered useless as they were black with grease, tar and coal dust. But lately ingenuity has converted that dirty substance into beautiful tissue paper, a ream of which weighs only 2½ pounds. It is used in the English potteries for transferring patterns to the earthenware and is found superior to any other substance ever known for that purpose, and it is so tenacious that a sheet of it twisted will support a weight of one hundred pounds.

The Weather and the Comet.

One of the meteorlogical reports published in London observes;—"The present season has hitherto been unusually mild, more so than was anticipated; but probably not more so than might be expected from the approach of the comet, which is expected to appear in March, 1848, about the tenth. 'If this occur' says Zadikel, 'the month of February will be extraordinary mild, and March be less severe a great deal than is foretold by the plan ets aspects, and then will the summer suffer the reaction, and be excessively wet and stormy."

Coal on the West Coast of America.

The British steam frigate Cormorant recently landed at Portsmouth, an excellent specimen of coal from Vancouver's Island, which was considered by competent judges to be good and serviceable coal, equal to any in the British mines, and which the Cormorant had been readily enabled to procure at the rate of 4 shillings per ton, whilst at the same time at Valparaiso, the price of British coal was as high as £46 per ton! The following particulars respecting the position of these coal treasures may not be uninteresting, as it is earnestly desired that these rich and valuable deposit may ere long be brought within the reach of the rapidly increasing commerce on the West Coast of America and the Pacific.

On the north and east side of Vancouver's Island, a recently discovered river debouches into Johnson's Straits, near the mouth of which large seams of coal crop out on the surface of the soil. At this point the trading steamer of the Hudson's Bay Company navigating the Straits of Juan de Fuca now readily obtains plentiful supplies, which is put on board by the Indians at a mere nominal price. Mr. Dunn, a trader and interpreter of the Company, states that the cause of the discovery of this coal was as curious as the discovery itself was important. Some of the natives at Fort McLoughlin having, on coming to the Fort to traffic, observed coal burning in the furnace of the blacksmiths, in their natural spirit of curiosity, made several inquiries about it; they were told that it was the best kind of fuel, and that it was brought over the great salt lake six months journey. They looked surprised, and, in spite of their habitual gravity, laughed and capered about. The people at the fort were surprised at their unusual antics and enquired the cause. The Indians explained, saying that they had changed in a great measure their opinion of the white men whom they thought endowed by the Great Spirit with the power of effecting great and useful objects, as it was evident they were not then influenced by His wisdom in bringing fuel such a vast distance and at so much cost.—They then pointed out where it could be found, of the richest kind, and close to the surface, rising in hillocks and requiring very little labor to dig it out. This intelligence having been reported at Fort Vancouver, orders for immediate exploration were given and after some inquiries and a small distribution of rewards, the original account given by the Indians was found to be true. The coal turns out to be of excellent quality, running in extensive fields, and even in clumpy mounds, and most easily worked all along that part of the country. The natives were anxious to be employed to work the coal, and they being so numerous and their labor so cheap, makes the expense of obtaining it but the trifling sum of about 4 shillings per ton, when on board ship.

Squaring the Circle.

A great number of people do not know what the meaning of this term is, and have curious ideas regarding it. It is simply to find out the true circumference of a circle by the diameter. The determination of the ratio of the circumference to the diameter has exercised the ingenuity of mathematicians in all ages, and in all likelihood will do so in future ages. As 7 is to 22, the Archimedian rule, is near enough for all common purposes.

What is the circumference of a circle, the diameter of which is 14?

As 7 is to 22, so is 14 to the circumference

$$\frac{22 \times 14}{7} = \frac{308}{7} = 44 \text{ circumference.}$$

A Mechanic Hermit.

A short time since there died at Lynn, Mass., George Gray, aged 76. He was a Scotchman by birth, and came to Lynn about half a century ago, located himself in a lonely spot, where he made his home till the time of his death. His early history is probably known to no one living, at least to no one in this country, for he always avoided giving information on the subject. He was a reflecting man, of considerable literary and scientific attainment, and capable of imparting knowledge in almost any of the higher branches of human learning. He took great pleasure in attending lectures and scientific meetings, and collected a considerable library. But his fondness for the mechanic arts was perhaps the most conspicuous trait, and he became very skillful in some branches connected with machinery.

If any one assumed to be a scientific mechanic, he was sure of a courteous reception, though not of admission to his dwelling.

He claimed to be the inventor of the most useful part of the ship's steering apparatus, but some one was before him in securing a patent, and was subjected to much expense and vexation in unsuccessful efforts to establish his claim As to physical exertion and endurance even in his old age, he was remarkable; sometimes he would walk into Boston on a winter evening, attend a lecture, and walk home afterwards—making a distance of not less than twenty miles. And many of the Salem people remember him as appearing at their Lyceum lectures, on winter evenings, with his dilapidated straw hat in hand, and perhaps with torn shoes and no stockings.

This showed his enthusiasm for scientific pursuits, and although he lived secluded and poor, yet he has left considerable money behind him and a character likewise free from blemish as it regards honesty and veracity.

Iron Mine.

We mentioned some months since, that the deposite of Iron ore, known to exist in the vicinity of Horicon, Dodge county, Wisconsin, had been found, on examination, to be both valuable and extensive. The deposite covers a space of two hundred acres; the whole extent is believed to be not less than six hundred acres. The ore is the brown oxide of Iron, commonly called "Bone Ore." It has been analyzed by two competent chemists, and found to contain sixty per cent of iron, and to be free from all impurities. Iron made from it has proved equal to any yet made in the United States.

The Mishawaukee Company of Indiana, and the Cleveland Iron Company, have each made arrangements to erect a blast Furnace at the mine during the coming season, with the expectation of commencing the manufacture of iron next fall.

Spontaneous Combustion.

A Louisiana cotton planter, upon removing a large pile of cotton seed that had accumulated near his gin house, found them to be on fire near the bottom. This is a fact, says the N. O. Delta, which should arrest the attention of all who raise or deal in cotton.

Bales of cotton are frequently in a smothered state of ignition, and want only a light current of air to set them in flames. The storehouse should be frequently examined. Some kinds of cotton are more disposed to spontaneous combustion than others. We are acquainted with the fact of one cargo of cotton having been three times on fire at as many different places where it had been distributed after being sold.

Scientific American—Bound Volumes.

The second volume of the Scientific American, bound in a superb manner, containing 416 pages choice reading matter, a list of all the patents granted at the United States Patent Office during the year, and illustrated with over 300 beautiful descriptive engravings of new and improved machines, for sale at this office—Price $2,75. The volume may also be had in sheets, in suitable form for mailing—at $2.

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Wonderful National Clock.

A great clock is proposed by a Committee of the House of Commons to occupy the tower of the new English House of Parliament It will be when completed the most powerful clock of the kind in the world. According to the specification, it is to strike the hours on a bell of from eight to ten tons, and, if practicable, chime the quarters upon eight bells, and show the time upon four dials about thirty feet in diameter. With but one exception the above dimensions surpass any other clock-face in Europe. The dial of St. Paul's is as yet the largest in England with a minute hand—it is eighteen feet in diameter. Most clocks with large bells have to be wound up every day—but this one is an eight day clock, and every resource of modern art will be made use of to render it a perfect standard. The frame is to be of cast iron, wheels of hard bell metal, with steel spindles, working in bell metal bearings, and to be so arranged that any one may be taken out to be cleaned without disturbing the others. Accuracy of movement is to be insured by a dead-beat escapement, compensating pendulum and going fusee.—The first blow of the hammer when striking the hour to be within a second of the true time. There is to be a galvanic communication between the clock and the Royal Observatory at Greenwich. The striking detent is to have such parts that whenever need shall arise one of the two following plans may be adopted, either that the warning movement may make contact, for a battery, or that the striking movement may produce a magneto-electric current. Apparatus is to be provided which will enable the attendant to shift the connection, by means of the clock action, successively to different wires of different hours, in case it shall hereafter be thought desirable to convey the indications of the clock to several different places. Should this plan be carried out, a signal may be conveyed to Greenwich with every stroke of the hammer, and thus insure an accuracy never before attempted. There are three candidates for the honor of making this National Clock, Mr. Vulliamy, who states his grandfather to have been clock maker to George II. ; Mr. Dent, the maker of the Royal Exchange Clock ; and Mr. Whitehurst of Derby. Two estimates have been sent in, one of £1600, the other £3373, but owing to some difference in opinion, and the withdrawal of one or two of the names, the maker does not appear to have been decided on. Mr. Dent has already made the best clock in England ; it is so true that a person standing in the street may take correct time from the face ; the first stroke of each hour is correct to a second. The explanations to the plans drawn up by the competitors contain remarks, among other matters, as to the relative merits of cable-laid catgut, or wire rope for lines to the new clock. Wire rope is used for the Exchange clock ; and, according to the manufacturer, a wire rope half an inch in diameter will bear eighteen hundred weight without breaking. The four sets of hands with the motion wheels, it has been calculated, will weigh twelve hundred weight ; the head of the hammer two hundred pounds ; the weights from one hundred and fifty to three hundred pounds. One of the candidates proposes to jewel the escapement pallet with sapphires, as preferable to stones generally made use of. The hands are to keep going while the clock is wound up, but the motion of the minute hand is not to be constant ; it will move once or twice every twenty seconds, when it will go over a space of nearly four inches.

In many of the clocks on the continent of Europe the whole of the works are highly polished—a luxury which it has been suggested had better be done away in this instance, as it creates trouble from the rusting of the wheels, without adding in the least to the value and accuracy of the mechanism. Mr. Airy the Astronomer Royal, has drawn up the specifications for it, and the whole is to be under his directions. He recommends the utmost facilities to visitors, and says that this clock shall be one of which the nation may feel proud and in which the maker ought to feel that his credit is deeply concerned. He also proposes that the access to it should be made good, and ornamented, and that facility should be given to the inspection of the clocks by mechanics and by foreigners.

The Shannon clock, in Limerick, Ireland, just completed, is the largest at present in the world. It is wound up on the principle of the capstan of a ship, and its striking can be heard within a radius of five miles.

Improved Mode of Cooling Mill Stones.

To the Editor of the Sci. American.

I noticed in one of the late numbers of the Scientific American, a description of an improvement of J. F. Penel, of France, the object being to cool mill stones. Perhaps that is the most proper and practicable way ; but I will offer another manner. I claim no originality, but presume that it may be new to many of your readers. I will not presume upon the intelligence of your readers by attempting to give any of the causes which generate heat in dressing mill stones, every miller ought to understand the principles of circular motion, and central forces. My plan is at once plain and simple. It is simply to have the casing around the runner well and properly fitted, making it about three inches larger than the radius of the stone, then apply one or two fans to the periphery of the stone so as to nearly fill the space between the casing and the stone ; it will be found to keep up a brisk circulation of air through the eye of the stone to the periphery ; it keeps the stones clear, sweet and clean, no 'hoop meal' remaining around them and the mill is not so apt to take fire from the hoop meal as is sometimes the case when the mill gets dull. This plan is found to be excellent in practice. A fuller explanation might be given and many other benefits noticed which your readers will no doubt at once perceive.

SYLVESTER LITTLEFIELD.

Alfred, Me., March, 1848.

The superiority of this plan over Mr. Pinel's is unquestionable. It is more simple and that is the very thing we like to see in all machinery.—ED.

Glasses for Rifles.

Mr. Editor.—I beg to ask of you some questions. Recently there has appeared in the West a new kind of globe lights to be attached to rifles, for the purpose of shooting at long distances, and I have understood that the plan was patented some time ago. From what I have learned of the plan it is to have a tube placed upon the barrel of the rifle, and attached to each end are lenses, for the purpose of making a kind of Telescope, so that in shooting a long distance, the object shot at will be rendered more distinct. What do you think of the plan?

Yours, &c., W. M. S.

Toledo, Ohio, 29th February, 1848.

[The plan of using a spy glass in combination with the rifle is both ingenious and useful. Not only for taking sight but for distant exploration, especially on the prairies. We have seen the spy glass used only in one instance in this manner by an old hunter on our northern lines, named J. Rhodi. This was six years ago.

Our correspondent can have the full description of any patent by paying the proper sum to the Patent office.—ED.

Cotton Manufacture.

Mr. Editor :—Your notice in the Scientific American of March 4th, of the old Cotton Factory of Samuel Slater, Esq. at Pawtucket, Rhode Island, is decidedly interesting to antiquarians—and I propose that you take measures to have the old "spinning frames" removed to the Patent Office. I do think the first spinning apparatus used in this country should be preserved as evidence of our progress in later years in the mechanic arts and manufactures.

I recollect that as late as 1809 or 1810 there was, on White River, in this State, a factory for *spinning* cotton—and the yarn was put out among the farmers' wives to be woven, and seventeen cents per yard paid for weaving cotton shirting 3-4 yard wide, which was then sold for fifty cents per yard. Yours, &c.

T. J. NEVINS.

Norwich, Vt. March 9, 1848.

[Printed calicoes can now be purchased for 9 cents per yard, as good as those made in 1809. What an improvement in science and art.—ED.

Dependence of Happiness anr Virtue on Health.

The extent to which human happiness, and I may add, too, human virtue, must depend on the integrity of the bodily organism and its functions, can hardly be calculated. There are some whose original fabrication is so defective, whose living machinery, or individual parts of it, are so prone to work wrong, that it would seem almost physically impossible for them to be happy and amiable in their feelings and tempers. While, again, in others, so perfect is the whole organisation, and consequently so healthy are all its functions, as to exempt them almost entirely from those multiform and terrible moral sufferings which come primarily from the body. Can we therefore avoid the conclusion that we may be physically predisposed—I had almost said predestined—to happiness or misery.—Such, in fact, is implied in the familiar expressions of happy and unhappy constitution or temperament. As, moreover, these vicious constitutions are but too often inherited, and must, probably, in the first iustance, have grown out of infringements of the organic laws, it becomes a literal truth, that the sins of the parents may be visited on their unoffending children even to remote generations.—The vast importance of a judicious physical education both to virtue and happiness, cannot now but receive its just appreciation ; for under its influence, even a bad constitution, and the moral infirmities which are its most necessary attendants, may be in a considerable measure corrected. And we can likewise understand how essential is a prudent moral discipline to the good health of the body. In a perfect system of education, the moral, intellectual and physical natures are each subjects of most important, if not equal regard. Finally, knowing how the disposition may be influenced by bodily conditions, ought we not to exercise a mutual forbearance, and to cultivate feelings of charity for those infirmities of temper which even the best of men will occasionally display, and which oftentimes belong more to the flesh than to the spirit ?—*Sweetser's Mental Higiene.*

Georgia Lumber Trade.

By the Savannah Georgian, we learn that there is every prospect of Savannah becoming at a very early day one of the first lumber markets in the world. A new steam mill is erecting there by Messrs. Bragby, Giles and Russell, which is to be one hundred and thirty-one feet long, by forty-seven wide, having three engines, carrying three gangs of saws, and a planing machine of approved construction. It is in a fine situation. On one end, is the wharf on the river, on the other and immediately in rear, a canal through which the timber is received from an enlargement or the basin of the Musgrove creek—the creek itself flowing into the river several hundred feet below the Mill site, and making with the river shore a very acute angle for some distance, so that the Mill has the river in front, and the creek in rear.

The Mill will turn out 20,000 feet of manufactured lumber in a day, which will amount to about six millions of feet in a year. It will require sixty vessels of 150 tons burden, every year, or thirty vessels of 300 tons, to carry away this lumber. To manufacture it will require at least thirty efficient hands, and the working of the planing machine altogether about forty hands, Then to stow away on board ship 20,000 feet of lumber a day, that is, to take it from the wharf and put it on board, eight or nine more hands are necessary, and that is not all, for two other classes come into requisition—the farmers, who cut, hew, and draw the timber to the water, and the men who bring down the rafts.

Our Savannah Exchange speaks truly when it says, that "millions of dollars worth of less bulky produce may be brought to and despatched from a railroad depot without requiring more than a few agents to handle it, but in the case under consideration we have seen how many persons are engaged, how numerous are the connexions and dependencies and through how many channels the current of accumulative industry circulates."

The Marlborough Cotton Factory in S. C., employs none but white operatives.

Mechanic's Mutual Protection.

At a meeting of Mechanics' Mutual Protection No. 35 of this city, held at their room in Cottage Place, on the evening of the 9th inst. the following expression of the sympathies and feelings of the members in relation to the death of a member was by resolution ordered to be printed.

"The officers and members of this Protection meet this evening to lament the sudden decease of Brother John Delamater, our presiding Past Senior. His death has filled our hearts with poignant anguish, as we were linked together by more than the common ties of brotherhood. We were few in numbers, being but recently organized, and we were all sincerely and personally attached to each other by an affection that never breathed an unkind word in any of our meetings, and which has rendered our association as one of nature's kindred. Br. Delamater we esteemed and admired both on account of his gentlemanly manners and his devoted attachment to our cause and association, but his manly form so towering and noble is now laid in the cold grave, and his voice that once cheered us by its kindly tones, is now silent as the tomb in which he slumbers. But two weeks ago to night and our Brother sat in his place here in all the vigor of manhood's prime, but now alas,

"He has gone,
To his long home,
Beneath the willow tree."

We sincerely sympathise with his respected parents and relatives, and we can feel that their bereavement is sad and afflicting. So sudden was the decease of our brother, that before his father could arrive from his home to receive the recognizant farewell of his son, the light of sensibility had vanished, and the lamp of life but flashed to die. As the sun was setting behind our western mountains on last Tuesday evening, the sun of Br. Delamater's life, after having run his short circuit of twenty-five years, also went down to rise no more while time exists.

The attention which his relatives paid to him in sickness is above all praise, so also, that of his brother mechanics with whom he labored in Mr. Secor's Foundry, it shewed the true spirit of brother craftsmen, and we as an Association of Practical Mechanics will always endeavor to cultivate the same, and in remembrance of our brother's decease, we will clothe the emblems of our Order in mourning till the end of next term, and would communicate this expression of our feelings with sincere respect to his parents and friends.

R. MACFARLANE, Senior Protector.

WM. HAGAR, Recording Scribe.

TO CORRESPONDENTS.

"J. H. B. S. of Geo."—Our government has offered no premium for squaring the circle.

"J. B. of Mass."—You will perceive that the pump is just two cylinders attached to a rocking shaft. By a closer examination you will perceive that no advantage is gained. If the column of water in one cylinder is used to assist against the pressure of the other, nothing is gained by that for that resistance has not to be overcome in the common pump.

"G. & L of N. Y."—Your caveat was forwarded on day of receipt. The other business cannot be done within five weeks. You will be consulted in the interim.

"J. B. of Mass."—A patent cannot be granted for an air engine such as you represent. Such an engine is not new.

"C. W. of Mass."—We shall be happy to notice the result of your experiment in propulsion against wind and tide. Be pleased to favor us with an account of it.

"J. W. of Mass."—Your principle for an air tight case for a horizontal water wheel, is already patented in 1840, by G. Z. Parker.—See list of patent claims for that year.

"D. E. S. of N. B., Mass."—We have answered you by mail some time since, and have been expecting an answer from you.

"G. A. S. of Ky."—In regard to the patent right of State or County, it is covered by the purchase and sale of the same, and is just a bargain between the patentee and purchaser. All infringements of this bargain must be settled by common law like any other bargain, purchase or sale case. An infringement of the patent is a different thing, and must be

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sued as a violation of the patent right of the inventor.

"M. D. C. of N. Lebanon."—We are trying to get a rule for you.

"J. R. N. of N. Y,"—No person scarcely will be likely to purchase without being first secured by a patent. We have seen nothing like your paddles, but upon a second consideration you will alter your views regarding the rail for railroads. The broader, deeper, and more solid the rail, the better.

"S. W. of N. Y."—We know of nothing better than borax for uniting iron and steel excepting the sulphate of zinc. The stucco for the outside of buildings was described (one kind) in a former number. There is another preparation of it patented by C. Clinton, Middletown, Orange Co., N. Y. Its parts we know but are not at liberty to give. We cannot tell the amount Mr. Hutchinson will take for his blacking. His address is "J. Hutchinson, Newbern, N. C." A first rate 3 horse power engine will be worth $450, all complete. Address Charles Mann, Troy, N. Y. Asphalte roofing (one kind,) is made of asphalte, fine sand, chopped straw and a little plaster of Paris. We do not think you can in any manner substitute the soldering for rivetting the hoe necks. We have in no instance but one seen a complete welding to answer as well as riveting the iron and steel. Try the sulphate of zinc for solder, and judge for yourselves. The lucubrating material, is the better of a little olive oil added. Thicken with the gum to the proper consistency. The soda not very strong in the water. Steep the gum for three days. This is all the secret.

"T. S. of S. C."—We will endeavor to comply with your request.

"J. H. of N. C."—We have answered you by mail.

"G. D of Indiana."—Microscopes from $6 to $40, some as low as $1. A first rate acromatic for $40, and one of excellent power for $10

"A. F. T. of Va."—We have answered you by mail, also R. P. of N. Y., and A. W of Maine.

"G. S. of Oswego."—We can give you the necessary information requested.

"B. B. L. of T."—We can furnish you with a first rate Magnetic Electric Machine, for 12 dollars in a neat and handsome box. Prof. Henry has made no improvement on the magnet to our knowledge. We cannot send you the back numbers to commence but with the volume.

"W. B. S. of S. C."—We have not seen Mr. Parker yet. The subject is now engaged in a law suit.

"W. A. D. of N. C."—We have sent you all the numbers of the present volume which you ordered and volume 2 complete, with the exception of No. 16, and that we have not got at present, but are in hopes to have soon, when we will forward. We consider Woodbury's horse power a very good one.

"L. F. M. of Ill"—We forwarded your machine last Monday per Wells & Co.'s Express.

"E. R of Milwaukie."—Your model has been received and you will hear from us by mail in a few days.

☞ Will Mr. Frederick Cook, of 188 First Avenue, inform us whether his diagram of a low pressure engine has yet been published. We have inquiries for it.

Extension of a Patent.

A bill has been reported in Congress from the Committee on Patents, which authorises John A. Adams, the inventor of a machine for flattening Window Glass, and for which a patent was granted in 1832, to have his patent renewed for seven years.

Those Prospectuses.

We hope every subscriber who received a prospectus of the Scientific American with their last week's paper, will use them for the object to which the publishers designed them, viz. each to procure new subscribers.

Spirit of Commerce.

The ship Minesota, of 800 tons, Capt. Allen, of western build, is advertised in the Louisville (Ky.) Journal to sail directly from that place for Liverpool, as the pioneer of a line of packets.

Patent Agency.

Applications for Patents made at this office, on the most reasonable terms. Neat drawings, specifications, and engravings of the first character, and cheaper than anywhere else. Notices of new inventions, Agency for the sale of Patent Rights, and all business of that nature, promptly attended to. Those who have patent rights to dispose of will find a good opportunity and field for their sale—such as Horse Power Machines and Waterwheels of every description. The largest circulation in the world for advertisements of inventions, &c.

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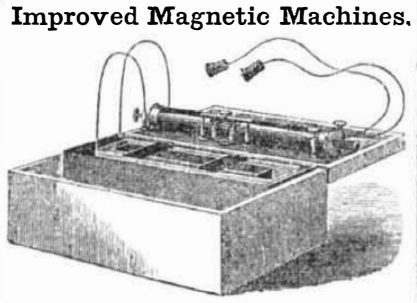

MOORHEAD'S GRADUATED MAGNETIC MACHINES.

IT is now universally admitted by the learned and scientific, that the mysterious power called Galvanism or Magnetism, is in fact the PRINCIPLE OF VITALITY OR LIFE, and that Disease in many of its most painful forms is entirely owing to the absence of this Galvanic or Magnetic power in its healthy proportions If then we can readily supply this wondrous power, when it is thus deficient, we can successfully combat disease ; and this has been fully and perfectly attained by the present beautiful and scientific instrument.

Moorhead's Graduated Magnetic Machine is an important improvement over all other forms of manufacture, and has been adopted by the Medical Profession generally, as being the most perfect, convenient and effective Magnetic machine in use. It is exceedingly simple in construction, and therefore not liable to get out of order, as is the case with all other instruments. It admits of the most perfect control, and can be GRADUATED to any power, adapted to the most tender infant, or sufficient for the strongest adult, at the option of the operator. The Magnetic influence is imparted in a continuous manner, and with no unpleasant sensation to the most delicate patient. It requires no assistant in its use, and is in every respect entirely harmless.

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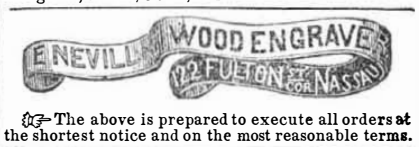

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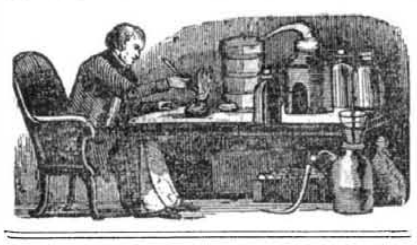


For the Scientific American.

The Magnet.

(*Concluded from our last.*)

A third way is called the circular stroke.—Four steel bars are placed so as to form a square upon which the opposite poles of magnets are drawn round several times. A magnet is in no degree weakened by communicating its power to iron or steel, but no magnet can give more strength than it possesses, yet if a steel bar is rubbed with several magnets united, it receives more power than belongs to each single magnet. Thus, by the connection of many magnets, artificial magnets of very great power may be obtained. By these methods masses of iron dust may be rendered magnetic.

The following way of making strong magnets was invented by a sea captain in 1821.—Two bars of soft steel 30 inches long and an inch broad were procured, also 6 other bars 8 inches long and half an inch broad, and a large bar of soft iron (iron pokers will answer the purpose as well as the iron bars) The large iron bar was first hammered in a vertical position, it was then laid on the ground with its acquired south pole towards the south and upon this end of it, the large steel bars were rested while they were hammered upon each other. On the top of one of the large steel bars each of the small steel bars were held vertically and hammered in succession, and in a few minutes they all acquired considerable lifting powers. Two of the small bars connected by two pieces of soft iron in the form of a parallelogram, were now rubbed with other four bars and placing them together so as to make a double bar in thickness—the north pole of the one even with the south pole of the other, and the other two bars put to these, one on each side, so as to have two north and two south poles together. Separate then the north pole from the south pole at one end by a large pin, and place bars perpendicularly with that end downwards on the middle of one of the parallel bars, the two north poles towards the south, and the two south poles towards the north, and slide them backwards and forwards three or four times the whole length of the bar, then take them away at the middle of this, and place them on the middle of the other bar and go over that in the same manner. Then again turn both bars upside down and repeat the operation. When this is done, change the places of the bars, taking the two touching bars and submitting them to the same operation, each pair after the other—treating each pair of bars in this manner a number of times and changing them whenever the manipulation has been continued about a minute, when the whole of the bars will be found to be highly magnetized, each pair lifting about six or eight ounces. Any bars which have been magnetized, and which have had their magnetism destroyed by heating or hammering, or the simultaneous contact of two poles of another magnet placed transversely, have always a greater facility to receive polarity in the same way as before than in another direction.

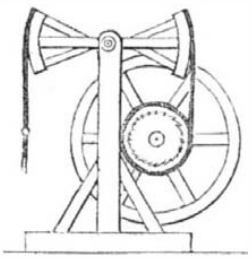
The magnet, or magnetic needle is a steel needle magnetized with loadstone and sustained on a pivot at its centre of gravity so that it has almost perfect freedom for horizontal motion. The earth itself is a great magnet and there are strange magnetic currents continually flowing through the earth and we should not be surprised if yet it would be discovered that all geological phenomena are to be attributed to these. Properly speaking, the poles, north and south of magnets are the reverse of what they are called, inasmuch as it must truly be the south pole of a magnet that is attracted by the great north pole of the earth. The most remarkable phenomena of the magnet in relation to terrestrial magnetism or that of the earth, is the variation of the magnetic meridian in most parts of the globe upon which depends the declination of the needle. The needle does not always point to what is generally understood by due north and south. In 1657 the needle pointed due north and south at Greenwich and it travelled gradually to the west in line of declination, but recent observations have led to the conclusion that a retrograde motion to the east has commenced — The declination of the needle has varied more in some places than others. The declination of the needle has not varied sensibly in New Holland for one hundred and forty years. The places where the greatest declination has been observed is in high latitudes north and south. The dip of the needle or declination from the horizontal plane, is 0 at the magnetic equator, that is the magnetic line that cuts the terrestrial equator, which is not straight but serpentine There are, however, phenomena about this which is not yet explained. One philosopher believes that there is a great magnet in the centre of the earth which revolves once in 440 years. This is a speculative view, but so far as magnetic currents are concerned recent observations are conclusive regarding their wonderful agency in terrestrial changes, and mechanical ingenuity has lately employed the magnet in the separation of ores, which like the discovery of the magnet for navigation, will entirely revolutionize the practical part of Metallurgy.

Engraving on Silver.

M. Poitevin, a civil engineer of Paris, has discovered a new mode of engraving on silver and copper, silvered, or gilt. M. N. de Saint Victor, had previously discovered the means of tracing drawings and engravings on paper, glass or metallic plates, but M. Poitevin announces that he can convert these tracings into engraved plates in relief or hollow which can be printed from. Two or three hours only, are required for the process, which is as follows The operator begins by exposing an engraving to the action of iodine, which deposits itself only on the black parts, there are papers which produce the opposite effects. The iodated engraving is then placed slightly upon a plate of silver, or silvered or gilded copper, as for the process of daguerreotype. The black portions which have received the iodine transfer it to the plate so that the iodine transforms into iodure the parts of the plate which correspond with them in the future representation of the design. The operator then plunges, for a few seconds, the plate, put into communication with a galvanic pile composed of a few elements, into a saturated solution of sulphate of copper, in relation with the negative pole, by a piece of platina. The copper deposit itself only on the parts which have not been covered with iodure, and which correspond with the white parts. There is thus a perfect representation of the engraving, in which the copper represents the white parts, and the iodated silver the black. The plate must not remain long in the solution, for in that case the entire plate would be covered with copper, When taken out, the plate is to be carefully washed in a large quantity of distilled water, and then plunged into a solution of hyposulphate of soda to dissolve the iodure or silver. The plate is again washed, and then dried. It is now to be heated to a sufficient temperature, to oxydize the surface of copper, which assumes successively different tints, until it arrives at a dull brown. The plate is then allowed to cool, and then the silver is amalgamated, the plate being slightly heated, in order to facilitate the operation. As the mercury does not combine with the oxide of copper, a design is obtained in which the amalgamated parts represent the blacks, and the parts covered with ozide the whites. The amalgamation being terminated, the plate is covered with two or three sheets of leaf gold, and the mercury is evaporated by heat. The gold then adheres solely to the black parts, and the non-adherent is brushed off This done, the oxide of copper is dissolved with a solution of nitrate of silver and the silver and copper underneath are attacked with weak nitric acid. The marks of the design which are protected by the gold not being attacked, the parts which correspond with the whites may be sunk as deeply as possible. The plate is then ready for printing in relief like wood blocks. For the other mode of engraving, viz., with the hollow cutting *en taille douce*, a plate is to be of copper covered with gold. In the bath of sulphate of copper the parts corresponding with the whites are covered with copper. The iodine or compound of iodine which is formed with the hyposulphate is removed. The layer of deposited copper is oxydized, and the gold is amalgamated, and may be removed with nitric acid. In this preparation the whites are preserved, and the hollow parts represent the blacks.

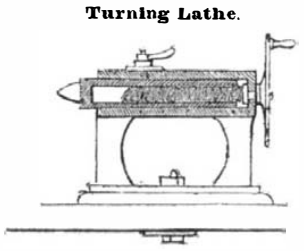
MECHANICAL MOVEMENTS.

Old Arch Head and Fly-Wheel.



In cases where the steam engine is used for pumping its motion may be different from that in which it is used for manufacturing purposes. In pumping the power is only to be applied in one direction, hence the single acting engine for some coal mines is just as useful as the double acting. If the horizontal beam in the above cut be vibrated and the drum to which the right hand is attached being placed loose on the fly wheel the click which takes into the first ratchet will produce a reciprocating or traverse motion in any thing to which the drum and ratchet may be attached by a cord or long shaft, even while the fly wheel may be continually revolving, and in this manner of catching and letting go the motion of a crank or arch head beam may communicate rotary and traverse motions to other parts of machinery, as they are combined together, either for pumping or other purposes. In no instance, however, would we connect the fly wheel with any arrangement but a rotary one. We have seen some machines otherwise constructed, but it is always at the expense of true science. The fly wheel is just a fountain of power to assist in passing the dead points and if any arrangement prevents the filling up of this fountain, it is in violation of first principles.

Turning Lathe.



This is a section view of the screw movement for adjusting the centre of a lathe, and as it is old and well known, the young mechanic will just step to his father's bench and observe the operation. He will also go and observe some of the new Slide Lathes and see the improvements made within the past few years.

Gravitation of the Electric Fluid.

Mr. Lake of the Royal Laboratory, Portsmouth, England, has communicated to the Lancet the results of a singular experiment, which appears to show that the electric agent is really fluid; and that when collected so as not to exert its powers of attraction and repulsion, it obeys the laws of gravitation like carbonic acid and other gases. The electric fluid was received in a Leyden jar insulated on a glass plate. At the lower part of the jar was a crack in the side, of a star-like form, and from around this the metallic coating was removed. On charging the jar, it was observed that the electric fluid soon began to flow out in a stream from the lower opening; and, on continuing the working of the machine, it flowed over the lip of the jar, descending in a faint luminous conical stream (visible only in the dark,) until it reached the level of the outside coating, over which it became gradually diffused, forming, as it were, a frill, or collar. When the jar was a little inclined on one side, there was a perceptible difference in the time of its escape over the higher and lower part of the lip, from the latter of which it began to flow first. On discontinuing the working of the machine, the fluid first ceased to flow at the lip of the jar, and then on the lower aperture. On renewing the operation, it first re-appeared at the lower aperture, and afterwards at the mouth. This very ingenious experiment appears to establish the fact, that the electric fluid is material, and is influenced under certain circumstances, by the laws of gravitation. Mr. Lake proposes for it the name of pyrogen, but this is inconvenient, because it is already applied to certain chemical products.

Solidification of Gas.

At a recent lecture on chemistry by M. Dumas, at Paris, he exhibited an experiment on the liquidification and solidification of the gas called the proloxyde of azote. Mr. Farraday and M. Nattern had already performed this experiment on a small scale, but M. Dumas, by means of a larger apparatus, and a more powerful pressure, has succeeded in demonstrating it in a way to be appreciated by the most unscientific observer. The temperature of the liquid resulting from the compression of the gas is so low as to be 115 degrees of centigrade below zero, and, when solid, it falls to the almost incredible extent of 140 degrees below zero. M. Dumas observed, that if a piece of ice, from the highest latitude in the world, were plunged in the liquid proloxyde, the effect would be the same, from the great difference in temperature, as that of the plunging a piece of red-hot iron in water.

Image of the Sun.

M. Becquerel has announced to the Academy of Sciences, at Paris, that he has ascertained that the image of the sun with its colors may be obtained on a plate of silver properly prepared. The preparation consists in submitting cautiously the plate to the action of chlorine. A fine photographic image of the sun, in which the orange, yellow, green, and blue are distinctly marked, is then obtained

Great Bridge.

At Cologne, France, a suspension bridge is about to be thrown over the Rhine by French engineers, similar to that which crosses the Danube at Offen. It will rest on a single pillar in the middle of the stream; and is to cost 150,000 thalers.

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